

ART. XVIII.—*Notes on the Rainfall Map recently Issued  
by the Government of Victoria.*

BY MR. ELLERY, F.R.S.

[Read 15th November, 1883.]

THE subject of rainfall is one of great importance to almost every community, and perhaps to none much more than to Australia, where "prosperity" or "poverty" is almost synonymous with its plenteousness or its paucity. There is, therefore, a constant anxiety in the public mind regarding the prospects of rain or of wet and dry seasons, and a widespread interest in the monthly and annual amount of rain that falls on the various areas of which settled Australia is composed. No amount of knowledge of this subject nor any human interference are likely to tangibly affect the amount of rain which nature provides for these regions; but an accurate knowledge of the amount provided, and its distribution both as regards area and time, are of the utmost importance and value, as showing on the one hand how much may naturally be expected to fall over any particular area or areas, and when; and, on the other, the provisions necessary to turn what does fall to the best account. Over a large part of the littoral areas of Australia rain falls every year on an average equal to that in the neighbourhood of London; but it is not so equally distributed over the year as in that place. Moreover, England generally, by reason of the immense influence of the "Gulf Stream," possesses an extremely humid climate, while Australia, for the most part, is extremely dry. Although, therefore, the actual rainfall be the same, these differing conditions make up a vastly different climate. With our dry atmosphere the same amount of rain does not "go near so far," and it has been gradually forced upon us that to make it go far enough for our needs we must not allow it to flow back to the sea without spreading its beneficence a little more widely over our thirsty but otherwise prolific soil. To obtain a good knowledge of our assets in this respect, the Governments of all the colonies have for some years past been spreading rain gauges over Australia, and gathering statistics from many hundreds of places, and the number is largely increased

every year. Already a very fair idea of the rainfall of various districts can be formed, and most valuable information on the subject obtained. To place this before the public in a clear and comprehensible manner has been one of the chief aims of the several colonial astronomers and meteorologists upon whom the collection of rainfall statistics devolves. Mr. Russell, of Sydney, has for two or three years past compiled a map showing the rainfall at each rain-gauge station in the year by means of a *black circle*, the diameter of which indicates the amount. Mr. Todd, of Adelaide, adopts a somewhat similar plan; but until now I have not taken any steps in this direction, principally on account of the cost of carrying out a really satisfactory method of doing so. Last year, however, a request was made in Parliament that a rainfall map of Victoria should be prepared, and the Government concurring, and undertaking to provide the necessary cost, I at once set to work. Some meteorological maps lately issued by the French Government, and a valuable little work published in America, entitled, *Distribution of Rainfall Over the Globe*, suggested to me an admirable method of graphically representing the amount and distribution of rain over the colony, as far as statistics were available, by grades of one colour. These methods, however, were expensive, involving a separate printing for each colour, but it was suggested by Mr. William Slight, the engraver of the Survey Department, that by a careful system of etching and toning a similar and equally good and distinct effect might be produced in one printing. Just at this time our fellow-member, Mr. W. Culcheth, who, since his residence in Australia, has taken a very practical interest in all matters pertaining to rainfall, irrigation, &c., submitted a sketch map he had prepared from statistics obtained from the Observatory, showing by different rulings the amount and distribution of rainfall over Victoria. This map was very carefully traced out, and I at once adopted it as the basis of the new rainfall map. Indeed, I may state that Mr. Culcheth had displayed such care and judgment in outlining the areas that it was found unnecessary to alter them, except in a very few instances, and to a trifling extent; and I must here acknowledge my indebtedness to this gentleman for the substantial help his tracing afforded me. The production of nine effective tones in one colour by etching and tinting was a very tedious and laborious undertaking, but the result is one of which the officers of the engraving

and lithographic branch of the Survey Office, who took immense interest and pains in the work, may well be proud. This method of grading, being once accomplished, is available for any future maps, so that for next year's map the work will be trivial as compared with this first one. The map consists of the new map of Victoria, combined with the south part of New South Wales and the west part of South Australia, upon which is printed in blue colour nine grades or tones, each grade being confined within certain irregular curved outlines or boundaries, forming a somewhat arbitrary limit to the areas, over which the rainfall was 5 to 10, 10 to 15, 15 to 20, and so on up to 50 or more, inches per annum. It must be remembered that these curved outlines have been put in with a somewhat free hand, and they must not be taken as strictly representing a margin beyond which the rainfall is 5 in. more or less than within it. Nevertheless, as the contour of the country, some topographical knowledge, as well as rain-gauge statistics, have been taken into account in tracing them, they may confidently be assumed as sufficiently near for all practical purposes. There are two or three prominent facts displayed by this map :—1. That the greatest rainfall takes place on the coast lines or on the summits of the high ranges, especially near the coast. 2. That the areas immediately in the lee of these ranges have a markedly lessened rainfall. 3. That, were it not for the mountain ranges, it appears probable the amount of rainfall in the southern and eastern portions of Australia would decrease gradually from the coast line to the central regions of the continent. It is proposed to issue a similar map every year; and I hope the one for the current year will be ready by February. It would be very interesting to have a map showing the average rainfall for many years, but the materials available for one to show an average five years are, I fear, as yet somewhat too meagre.

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ART. XIX.—*The Return of the Pons Comet.*

BY MR. ELLERY, F.R.S.

[Oral communication 15th November, 1883.]